Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

NOTE. Since this was written Mr. W. T. Swingle has discovered that our own *Atta tardigrada* has the same habits as its South American relatives, Several fungous gardens have been taken from nests near Washington, and the writer has seen beautiful Kohlrobi tufts growing on the dung of leaf-eating insects. ERWIN F. SMITH.

ZOOLOGY.

Irish Fresh-Water Sponges.—In a recent number of the *Irish Naturalist* (Vol. iv, pp. 122–131), Dr. R. Hanitsch enumerates six species of Spongillidæ from Ireland, the " British fauna " containing but four species. Three of these occur in Ireland, the other three sponges, all from the west coast of the latter country, being also North American species. Dr. Hanitsch would not solve this interesting distributional problem by supposing a former extension of the sponges over the whole northern hemisphere; he believes that their gemmules could readily have been carried across the Atlantic by winds, ocean currents, or birds. In some remarks on the European distribution of the Spongillidæ, Dr. Hanitsch notices their extreme rarity in southern Europe. Only one species is known from the Iberian peninsula (N. Portugal), two from the Italian, while none at all have been found in the Balkan. (Natural Science, July, 1895.)

Reproduction of the Edible Crab.—Through the observations of Mr. Gregg Wilson, some new facts have been brought to light concerning reproduction in the edible crab (*Cancer pagurus*) of the Northumberland coast, England. Crabs that have recently cast their shells have pale ovaries that show no development of ova to the naked eye. Hard crabs have brilliant orange or scarlet ovaries, with ova distinctly visible. Both lots are taken in the catch from October to February. Spawning seems to take place only every second year of the crab's life. At no time were ova undergoing segmentation found within the crab, so that the old idea that fertilization is internal must be abandoned. Milt is undoubtedly passed by the male crab into the body of the female, but it does not affect the roe before extrusion. It is received in flask-shaped *receptacula seminis*, that open off the oviducts quite near the genital apertures. They are well-valved and seem to retain the motionless spermatozoa for long periods. Spawning was noticed to take place during November, December and January. The author is inclined to think that there is a migration connected with either the spawning act or the hatching out of the ova. The mature female crab is usually 6½ inches in size, while males, are mature when much smaller. (Proceeds. Roy. Soc., Edinburgh, Vol. XX).

The Odonata of Lower California.—Various collections of Dragon-flies from Baja California have been acquired from time to time by the California Academy of Sciences, and these form the basis for a memoir recently published by Dr. Philip P. Calvert. The total number of specimens examined is 2600, representing 40 species, of which 6 are new. Of these species, 9 are distributed over a considerable part of temperate America; 18 are neotropical, and 18 nearctic in distribution, while 3 of the species described as new are, according to present knowledge, restricted to Lower California. One of the objects of the paper is to determine the amount of variation in structural details, especially in the venation of the wings, assumed to be of generic character. These variations are to be found under the respective species.

Three page plates, containing 123 figures, accompany the descriptions of the species. (Proceeds. Cal. Acad. Sci. (2) IV).

Baur on the Temporal Part of the Skull,[1] and on the Morphology of the Skull in the Mosasauridae.[2]—In the first paper Dr. Baur reviews the work which he has done in the difficult analysis of the temporal region of the reptilian skull, in former years, and what has been done since by other authors. His results may be summed up as follows. The question relates principally to the determination of the three elements that connect the quadrate bone with the skull superiorly and anteriorly. These have usually, says Baur, been termed the squamosal, supratemporal, and quadratojugal. He adopts this nomenclature for the first and third, but wishes to replace the second by "prosquamosal" of Owen. This is because the name supratemporal was used previously for a different element peculiar to the Teleostomous fishes. The present reviewer has called the three bones in question, the paroccipital, supratemporal, and zygomatic, after earlier authors. Baur maintains that the element which he, with some other authors calls the squamosal, is not homologous with the paroccipital of the tortoises and Ichthyosaurs, as I have supposed. He agrees with those authors who think that the paroccipital of the Squamata, Crocodilia, etc., is fused with, and undistinguishable, in the adult skull, from the exoccipital. As proof that this is the case, he cites the opinion of various authors, and especially that of Hallmann, who, he alleges, demonstrated this to be the fact in 1837. On this essential point it may be remarked, first, that most of the authors cited have simply supposed this to be the case without making any attempt to demonstrate it. Second, although I have repeatedly examined crania of lizards from the first appearance of ossification, I have never observed a distinct center in the position of the paroccipital of tortoises and which Hallmann and others regard as the representative of that bone; nor have I observed it in the Crocodilia. W. H. Parker has not seen it, nor does Baur say he has done so. After having announced his discovery of it in Sphenodon, he afterwards changed his mind and concluded that he had been misled by appearances. Until the presence of such an element in the Squamata is demonstrated, I must continue to regard the element called by Baur in that order, the squamosal, as the paroccipital. In the Mosasauroids the element has more nearly the position of the paroccipital of tortoises than in any other of the Squamata. I may say that I have not been able to see Hallmann's memoir, and that I am entirely open to conviction when the evidence shall be produced, though I suspect that it will not be forthcoming.

---

[1] Remarkungen ueber Die Osteologie der Schläfengegend der höheren Wirbelthiere. Anatomischer Anzeiger, X, 1894, p. 316.

[2] The American Journal of Morphology 1894, p. 1.

In stating his disagreement with my conclusion on this point, the author does not make it clear that he has come to agree with me in two points on which we formerly differed. Thus he now agrees with my view of 1871, that the single postorbital bar of the Lacertilia is homologous with the superior bar of Sphenodon, and not the inferior, as he has recently maintained, though he at one time agreed with me. He also agrees that the suspensorium of the quadrate of the Ophidia is the paroccipital (squamosal Baur), and not the supratemporal (prosquamosal Baur); an opinion in which I have been alone hitherto.

If the element which I have identified with the paroccipital in the Squamata, is not that element, it is not thereby proven that it is identical with the squamosal of the Mammalia. Moreover it cannot be homologous with the element in the Ichthyosauria, Cotylosauria and Stegocephalia with which Baur identifies it, since it is a brain-case bone, while the latter is a temporal roof-bone, a fundamental difference. For this reason I have called the latter the supramastoid. (See my paper on the Transactions of the American Philosophical Society, 1892, p. 11).

The student who desires to become acquainted with the opinions of authors on the points involved, cannot do better than consult Dr. Baur's paper. His references to the literature are full, and his method in this respect is a model worthy of imitation.

Having seen that Dr. Baur now agrees with me that the bone which supports the quadrate in the Ophidia is not the supratemporal (prosquamosal) I will take up his older, but above last-mentioned paper on the Pythonomorpha. Like Owen, Marsh and Dollo, he does not perceive that this group is essentially distinct from the Lacertilia, and concludes with them that I have erred in alleging it to present affinities to the Ophidia. He places it in the order Lacertilia and in close proximity to the Varanidæ as did Cuvier.

In order to determine this matter, it is necessary to know, in the first place, what the characters are that distinguish snakes from lizards. The superficial characters given by systematic writers generally as distinguishing the Lacertilia and Ophidia, are quite insufficient for that purpose. Johannes Müller[1] first placed the distinction on a sound basis by showing that in the Ophidia the frontal and parietal bones descend to the basicranial axis as in no other vertebrates, thus closing the brain case in front, while in the Lacertilia this does not occur, and as the ali- and orbitosphenoid bones are rudimental or wanting, the brain case is without osseous wall in front. Some lizards present a distinct approximation to the Ophidian type in the strong decurvature of the parietal bones at the sides: these are the Annulati and the Anniélloidea. These groups display a similar approximation in the continuous sutural union of the occipital and parietal elements, a condition universal in Ophidia, and rare in Lacertilia.

I have pointed out[2] another distinction between the two divisions, viz., that the supratemporal ("squamosal," "prosquamosal") is present in the Lacertilia and absent in the Ophidia. As it is, however, absent in the Annielloidea and Amphisbænia, I have not included it in the definition of the former suborder. This definition has not been adopted by those authors who erroneously regard the suspensorium of the quadrate bone in the Ophidia as identical with the supratemporal of the lizards, but my view has now received the assent of various anatomists, as e. g., Prof. Baur.

A third distinction is that the quadrate bone is supported by the paroccipital in the snakes, and the exoccipital in the lizards. Baur and some others do not, however, agree that the suspensorium in the snakes is the paroccipital, but call it squamosal and other names. I was led to identify it with the former element of the Testudinata, etc., by a consideration of its structure in the Pythonomorpha,[3] where it is much more largely developed than in the Lacertilia, and where it supports the quadrate bone as in the Ophidia. The accompanying figures make this more clear. The paroccipital bone is received deeply between the exoccipital and the petrosal in the Pythonomorpha in the same manner as in the Tortricine snakes; a structure which does not occur in the Lacertilia. This structure is somewhat masked in some genera of Pythonomorpha by the extension of the exoccipital over the paroccipital as a thin lamina on the posterior side; in that case its true relation to the petrosal can be seen on the anterior side. In the Lacertilia the quadrate merely touches the paroccipital bone, whose distal end has a *convex* surface (Figs. 1, 1a), but it articulates with the exoccipital bone. This it never does in the Ophidia and Pythonomorpha. This is a fundamental difference between Lacertilia and Pythonomorpha to be added to those which I have already given.

---

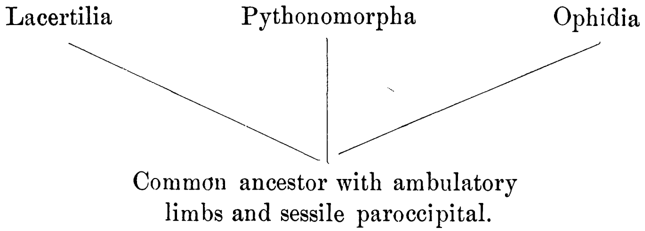
[1] In Tiedmann u Treviranus Zeitschrift f, Phisiologie, IV, 233.

[2] Proceeds. Amer. Assoc. Adv. Sci., 1871, p. 221; Trans. Amer. Philos. Soc., xiv, 1869, p. 29.

For this reason, and in view of the various important differences from the Varani, it is necessary to believe that the Pythonomorpha form a line distinct from the Lacertilia, and that their resemblances to the Varani are the result of a parallel evolution rather than an indication of near affinity.

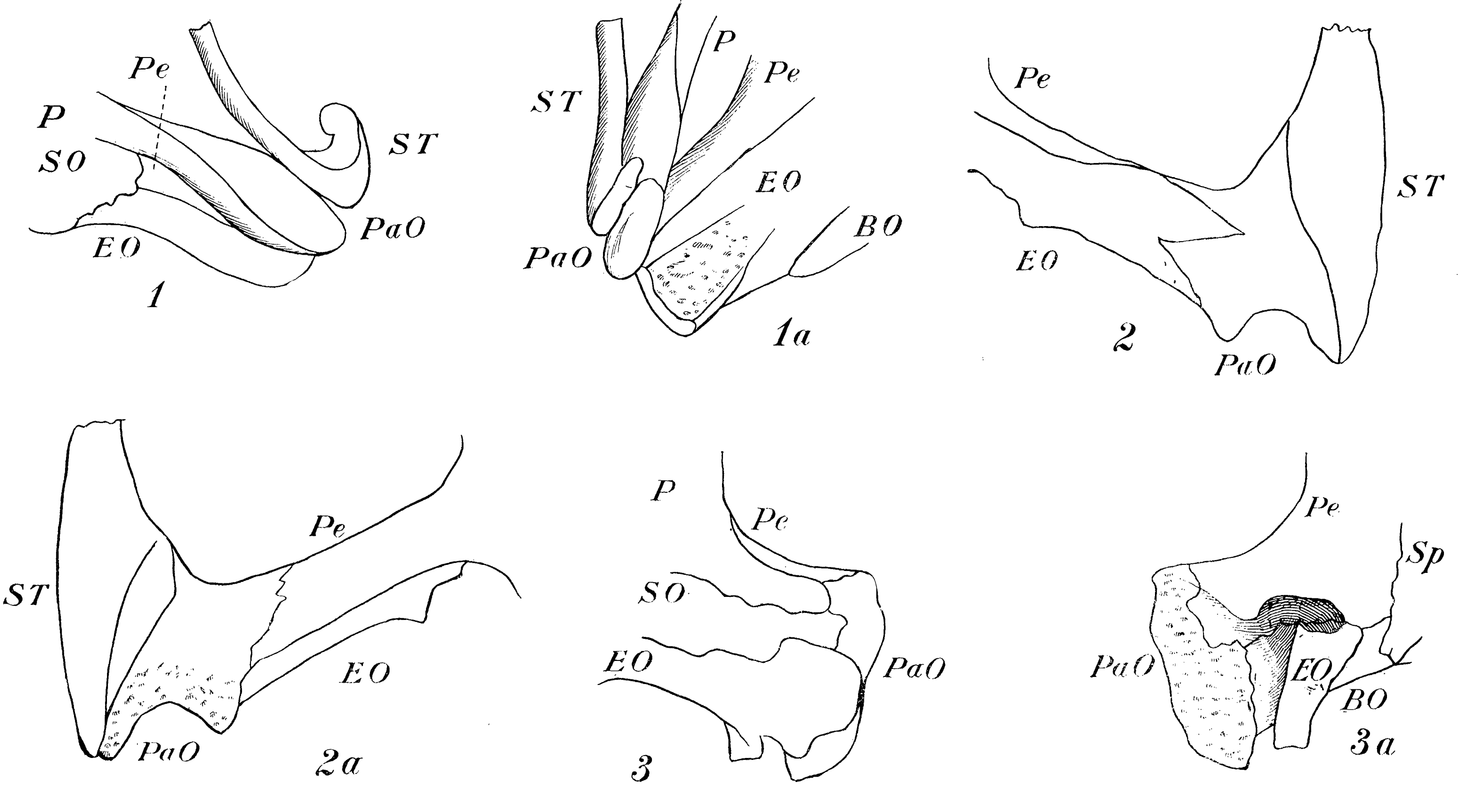
The failure of Cuvier, Owen, Dollo, Baur and Marsh to perceive this fact is due to their want of information as to what the differences between the Ophidia and Lacertilia really are.

From this point of view the Ophidia and Pythonomorpha must be traced to some type in which the paroccipital bone is less remote from the brain case than is seen in the Lacertilia, where it has become a mere rudiment. Such a phylogeny could be expressed as follows. An investigation of ths Dolichosauria of the Cretaceous might yield interesting results.


Lacertilia
Pythonomorpha
Ophidia
Common ancestor with ambulatory limbs and sessile paroccipital.

[3] L. c., and the Cretaceous Vertebrata of the West, U. S. Geol. Surv. Terrs, Vol. II, 1875.

PLATE XXXI.



Suspensoria of Reptilia Squamata.

The characters of the three suborders of the Squamata are then as follows:

Quadrate bone articulating with exoccipital; paroccipital external to bones of brain case; parietal bones not closing the brain case in front; generally an epipterygoid and sternum; teeth with dentinal roots; phalanges with condyles; *Lacertilia.*

Quadrate bone articulating with paroccipital, which is embraced by bones of brain case; parietal bones not closing brain case in front; epipterygoid and sternum present; teeth with osseous roots; phalanges truncate; *Pythonomorpha.*

Quadrate bone articulating with paroccipital; parietal and frontal bones closing brain case in front; no epipterygoid or sternum; teeth rootless; no phalanges; *Ophidia.*

I cannot agree with Boulenger that the Chamæleontidæ represent a division of equal rank with these three, as most of the characters may be found in one Lacertilian or another, and the group is in many ways related to the Agamidæ of the Pachygloss division. For me it represents a superfamily for which the name Rhiptoglossa is available.—E. D. COPE.

EXPLANATION OF PLATE.

Views of suspensoria of quadrate bone of Squamata. 1. *Varanus griseus* from above; *b*, from below and forwards. 2. *Mosasaurus dekayi* from above; *b*, from below. 3. *Ilysia scytale* from above; *b*, from below. S O, supraoccipital; E O, exoccipital; PaO, paroccipital; Pe, petrosal; P, parietal; B O, basioccipital; Sp, sphenoid. The dotted surfaces represent the articular surface for the quadrate.

A New Xantusia.—A specimen sent me by Dr. J. J. Rivers of Berkeley, Cal., taken at Tejon Pass California, indicates a new and handsome species of Xantusia. It is allied to the *Zablepsis henshavii* of Stjeneger (see last number of the NATURALIST where the genera of Xantusiidae are defined), but differs in generic characters. It has longer limbs and a longer tail than in either of the Xantusiæ known. The hind leg extended forwards, reaches the shoulder, and the tail is twice the length of the body. There is but one row of superciliary scales, and there is but one frontoparietal on each side. Seven superior labials, not separated by scales from orbit. Four inferior labials, the fourth separated from the third by the large third infralabial, which reaches the lip border. Fourteen to sixteen longitudinal rows on the belly. Ten femoral pores. Color above light reddish-brown, marked with two or three rows of large maron spots. Head above maron, the plates pate bordered. Inferior surfaces pale reddish-yellow. Dength 124 mm.; of head and body, 51 mm.

This species is nearer to the *X. vigilis* than to the *X. riversiana*, but differs greatly in its proportions, and in numerous details of scutellation and in coloration. It is nearer to the *Zablepsis henshavii* Stjen., but besides the generic characters, that species has a shorter hind leg, a continuous series of lower labials, and a different coloration.—E. D. Cope.

Bats of Queen Charlotte Islands, British Columbia.—During the past two or three years several small collections of bats, numbering in all 12 specimens, have been sent me from the Queen Charlotte Islands. They were obtained at a place called Massett, at the north end of Graham Island, by the Rev. J. H. Keen, and were transmitted through the courtesy of Mr. James Fletcher, of Ottawa. All of these bats belong to the genus *Vespertilio.* They represent three very distinct specific or superspecific types, namely *V. subulatus, V. lucifugus* and *V. nitidus.* In each case the specimens differ in color from the typical form, being decidedly blackish instead of brownish. The ears, feet and membranes, are nearly black, and the color of the fur is very dark.

The Queen Charlotte Islands representative of *V. lucifugus* differs further from the typical form (from the eastern United States) in having decidedly larger feet and in the form of the ear conch, which is less emarginate posteriorily. It may be worthy of subspecific recognition.

The representative of the big-eared *V. subulatus* is so different from the eastern animal that I am forced to describe it as new, and in so doing it gives me pleasure to associate with it the name of its collector, the Rev. J. H. Keen. It may be known by the following description:

Vespertilio subulatus keenii subsp. nov.—Type from Massett, Queen Charlotte Islands, B. C.

Type No. 72922 ♀ ad. U. S. National Museum, Department of Agriculture Collection. Collected by Rev. J. H. Keen, in summer of 1894.

General characters.—Similar to *V. subulatus*, but with shorter, narrower wings, and larger ears; color blackish instead of brownish. Ears, feet, and membranes black except the under surfaces of the wing bones, leg bones, and tail vertebræ, which parts are flesh colored. Fur, blackish, slightly washed with brownish. Ears very long: laid forward they project 3 mm. beyond the nose. Tragus long, slender, and slightly arcuate. Wings attached to feet near base of toes.

Measurements (from alcoholic type (♀ ad.) in good condition).—Total length, 82 mm.; head and body, 42; tail, 41; head, 17.5; ear from inner basal angle, 16; tragus from inner attachment, 8; humerus; 23; forearm, 35.5; thumb, 7; third finger, 57; fifth finger, 46; tibia, 17; foot, 8.

C. HART MERRIAM.

Migrations of the Lemming.—A valuable account of "*Myodes lemmus*, its Habits and Migrations in Norway," has been published by Prof. R. Collett, of Christiania. The nature and habits of the lemming are described, and their suicidal migrations discussed on a basis of the author's personal knowledge of the lemming. The migrations seem to be due to over-population. During certain years an abnormal fecundity takes place among these creatures, and the consequences of this multiplication is given by the author as follows:

"The enormous multitudes require increased space, and the individuals, which, under normal conditions, have each an excessively large tract at their disposal, cannot, on account of their disposition, bear the unaccustomed proximity of the numerous neighbors. Involuntarily the individuals are pressed out to the sides until the edge of the mountain is reached. In a short time they enjoy themselves there, and the old individuals willingly breed in the upper region of the forests, when, at other times, they are entirely wanting. New swarms, however, follow on; they could not return, but the journey proceeds onwards down the sides of the mountains, and when they once reach the valleys they meet with localities which are quite foreign to them. They then continue blindly on, endeavoring to find a home corresponding to that they left, but which they never regain. The migratory individuals proceed helplessly on to certain death. The writer thinks it probable that the wandering instinct developed in migratory years is of distinct service to the species in reducing surplus population.

The Brain of Microcephalic Idiots.—A paper embodying the results of a thorough examination of the brains and skulls of two typical microcephals, by Prof. D. J. Cunningham and Dr. Telford-Smith, has just been published in the Transactions of the Royal Dublin Society. The authors accept the view arrived at by Sir George Humphrey, from the examination of microcephalic and macrocephalic skulls, viz.: "There is nothing in the specimens to suggest that the deficiency in the development of the skull was the leading feature in the deformity, and that the smallness of the bony cerebral envelop exerted a compressing or dwarfing influence on the brain, or anything to give encouragement to the practice lately adopted in some instances of removal of a part of the bony case, with the idea of affording more space and freedom for the growth of the brain. In these, as in other cases of man and the lower animals, the brain-growth is the determining factor, and the skull grows upon and accommodates itself to the brain, whether the latter be large or small." (Nature, 1895.)

Zoological News, Birds—During the recent visit of Messrs. Brewster and Chapman to the island of Trinidad, the observations of Mr. Chapman on the song habit of the Rachette Hummingbird (*Pygmornis longuemareus*) were confirmed by the discovery of a locality to which the birds evidently came to sing. This resort was frequented also by *Phaethornis guyi* for the same purpose. The latter, while singing, spreads the tail feathers to the fullest extent, pointing them forward over the back until the tips of the long central feathers nearly touch the back of the head. The effect is most striking, the birds suggesting diminutive turkey-cocks. All the specimens killed at these haunts were males. (The Auk, XII, 1895).

The family name of Macropterygidæ is proposed for the Tree-Swifts of Malaysia, by Mr. F. A. Lucas, instead of Dendrochelidonidae, which is preoccupied. To the differential characters described in a previous paper, the author adds the following three important ones:

	Micropodidae.	*Macropterygidae.*
Hypsotarsus,	simply grooved,	with an tendinal foramen.
Shoulder-muscles,	strictly Cypseline,	Passerine.
Deep Plantars,	strictly Cypseline,	characteristic.

The author states that the differences between the Macropterygidae and other Swifts are as great as those existing between any two families of Passerines with which he is acquainted. (The Auk, Vol. XII, 1895).

ENTOMOLOGY.[1]

Chordeumidæ or Craspedosomatidæ ?—This family of Diplopoda has been classified by different authors under the Iulidæ, Poly-

---

[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.